Study Guide for Genetics Quest Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**\*Vocabulary\***

Gene

Allele

Dominant

Recessive

Genotype

Homozygous

Heterozygous

Trait

Phenotype

Inherit

X-linked

Incomplete dominance

Co-dominance

Autosomes

Sex chromosomes

Carrier

Gametes

**Gregor Mendel**

Who was he? Where did he live? When?

What organism did he study? What traits of this organism?

What are his two laws? Be able to explain and apply them.

**Punnett Squares**

Be able to set up a monohybrid (4-square) or dihybrid (16-square) cross when given information about parents

Be able to give the genotypes and phenotypes of the offspring and the likelihood of each

Be able to work “backwards”; if given completed PS can you give the parental genotypes?

Example. ? ?

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| --- | --- |
| Bb | bb |
| Bb | bb |

?

?

**Patterns of Inheritance**

*Complete dominance*

Recessive alleles are only seen in phenotype when no dominant alleles are present

*Incomplete dominance*

Heterozygous individuals have a phenotype which is a blend of both traits

Ex. RR = red; RW = pink; WW = white

*Co-dominance*

Heterozygous individuals have a phenotype which expresses both traits

Ex. Roan (white and red – not a blend) coats in cows. X-linked inheritance

*X-linked*

*Trait on X chromosome; since males only have one X-chromosome, they will have the disease if inherit the allele*

**Practice question**

1. Which of these combinations results in the expression of a **recessive** trait?
2. two dominant alleles C. a dominant sex
3. two recessive alleles D. a dominant allele and a recessive allele
4. In horses, the allele for straight hair (B) is completely dominant to the allele for curly hair (b). Which of these sets of parents can produce offspring with curly hair?
5. a heterozygous male with straight hair and a heterozygous female with straight hair
6. a heterozygous male with straight hair and a homozygous female with straight hair
7. a homozygous male with curly hair and a homozygous female with straight hair
8. a homozygous male with straight hair and a homozygous female with straight hair
9. The allele for attached earlobes (e) is recessive to the allele for unattached earlobes (E). A heterozygous female and a heterozygous male have a child. What is the probability that the child has attached earlobes?
10. 0% B. 25% C. 50% D. 75%
11. Explain how two round seed plants can produce offspring with wrinkled seeds. Round is dominant.
12. In guinea pigs, the allele for black hair (B) is dominant to the allele for brown hair (b). Two black-haired guinea pigs are crossed. One of the guinea pigs is homozygous for black hair and one is heterozygous.
13. Complete a Punnett Square of the cross.

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1. What percentage of the offspring is expected to have black hair? \_\_\_\_\_\_\_\_\_\_\_\_
2. A heterozygous tall red flowered plant is crossed with a short white flowered plant. Red (R) and tall (T) are dominant. How many, out of 16, will be red and short? \_\_\_\_\_\_\_\_\_\_\_

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